Soil name: Isla Bank

Overview

Isla Bank soils occupy about 2700 ha on high terraces in the Otautau district and on undulating to rolling slopes on the low hills adjacent to Winton. They are formed into deep loess overlying gravelly alluvium and tertiary limestone bedrock. Isla Bank soils are moderately well drained, with deep rooting depth, high water-holding capacity and silt loam textures. Present use is pastoral grazing with sheep, dairy and deer with some cropping. Climate is cool temperate with regular rainfall. Soil seldom dry out.

Soil classification

NZ Soil Classification (NZSC): Typic Orthic Brown; stoneless; silty.
Previous NZ Genetic Classification: Yellow-brown earth

Classification explanation

The NZSC of the Isla bank soils is consistent with the previous classification. Isla Bank are well-drained soils with yellow-brown subsoils, and rarely suffer from drought. The subsoil is well structured to 90cm depth, providing good rooting volume. The soils have P-retention of 35–50%, are typically stone free and have silt loam textures to 90cm deep.

Soil phases and variants

Identified units in the Isla Bank soils are:

- Isla Bank undulating deep (IbU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Isla Bank rolling deep (IbR1): has no gravel within 90cm depth; occurs on slopes of 7–15°
- Isla Bank steep deep (IbS1): has no gravel within 90cm depth; occurs on slopes of >25°

The soil properties described in this Technical Data Sheet are based on the most common phase, Isla Bank undulating deep (IbU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Isla Bank steep deep (IbS1).

Associated soils

Some soils that commonly occur in association with Isla Bank soils are:

- Te Mara: imperfectly drained soil formed into mixed loess and fine colluvium from limestone
- Kauana: shallow soil forming onto limestone bedrock
- Waianiwa: imperfectly drained Brown soil with a fragipan

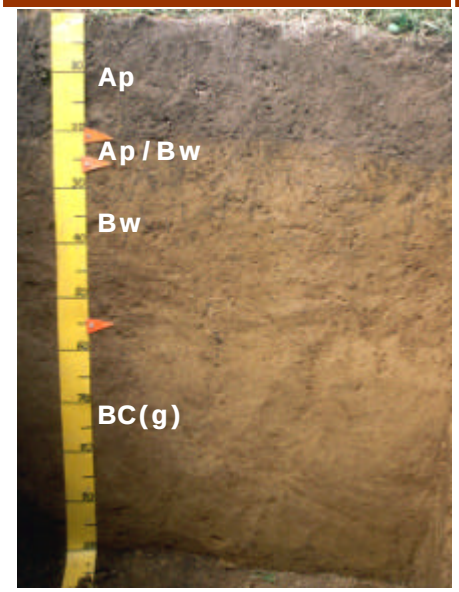
Similar soils

Some soils that have similar properties to Isla Bank soils are:

- Waikiwi: well drained Brown soil; typically has a structureless, firm lower subsoil
- Lyoncross: well drained Brown soil formed on high to intermediate terraces of the lower Waiau Valley
- Waimatuku: found on high terraces of the Southland plain, between the Oreti and Aparima rivers; typically has a compact, weakly developed fragipan in the lower subsoil

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Isla Bank profile	Horizon	Depth (cm)	Description
	Ap	0–21	Greyish yellow brown silt loam; weak soil strength; moderately developed very fine to medium polyhedral structure; abundant roots
	Ap/Bw	21–26	Dull yellowish brown silt loam; many worm casts; weak soil strength; moderately developed very fine to medium polyhedral structure; abundant roots
	Bw	26–56	Dull yellowish brown silt loam; few worm casts; weak soil strength; moderately developed very fine to medium polyhedral structure; many roots
	BC(g)	56–90+	Dull yellow orange silt loam; few bright brown and few dull yellow-orange mottles; slightly firm soil strength; moderately developed medium to coarse blocky and polyhedral structure; few roots

Key profile features

Isla Bank soils have 20–30cm deep topsoils that have a moderate to strong structure. Subsoil structure is moderately developed throughout.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–21	Moderate – High	*Moderate*	Silt loam	Gravel free
Ap/Bw	21–26	Moderate	*Moderate*	Silt loam	Gravel free
Bw	26–56	Moderate	*Moderate*	Silt loam	Gravel free
BC(g)	56–90+	Moderate – High	*Slow*	Silt loam	Gravel free

Profile drainage: Moderately well

Plant readily available water: *High*

Potential rooting depth: Deep

Rooting restriction: No major restriction

Key physical properties

Isla Bank soils have a deep rooting depth and high plant available water, meaning there is no major restriction to plant growth. Aeration is typically good, but the slow permeability of the lower subsoil can cause short-term waterlogging after heavy rain. Textures are heavy silt loams, with topsoil clay content of 28–32%. Soils are stonefree.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–21	Moderate	Moderate	Moderate	Very high	High	Low	Very low	Low
Ap/Bw	21–26	Moderate	Moderate	Moderate	High	Moderate	Low	Very low	Low
Bw	26–56	Moderate	Moderate	Low	High	Moderate	Low	Very low	Low
BC(g)	56–90+	Moderate	Moderate	Low	High	Low	Moderate	Very low	Low

Key chemical properties

Topsoil organic matter levels are 5–7%; P-retention 35–45% and pH moderate (high 5s). Cation exchange is moderate and base saturation high, reflecting the limestone influence. Available calcium levels are high with magnesium and potassium low. Reserves of phosphorus are also low. Micronutrient levels are generally adequate.

Vulnerability to environmental degradation

Note: the vulnerability ratings given in the table below are generalised and should not be taken as absolutes for this soil type in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time. Specialist advice should be sought before making management decisions that may have environmental impacts. Where vulnerability ratings of Moderate to Very severe are indicated, advice may be sought from Environment Southland or a farm management consultant.

Vulnerability factor	Rating	Vulnerability compared to other Southland soils
Structural compaction	moderate	These soils have a moderate vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage, moderate clay and organic matter content.
Nutrient leaching	moderate	These soils have a moderate vulnerability to leaching to groundwater. This rating reflects the moderately well drained profile characteristic, offset by the high water-holding capacity and slow permeability.
Topsoil erodibility by water	slight	Due to the moderate clay and organic matter content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	slight	Vulnerability to long-term decline in soil organic matter levels is partly dependent on soil properties and highly dependent on management practices (e.g., crop residue management and cultivation practices).
Waterlogging	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage, but slow subsoil permeability.

General landuse versatility ratings for Isla Bank soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. These ratings differ from those used in the past in that sustainability factors are incorporated in the classification.

Refer to the Topoclimate district soil map or property soil map to determine which of the soil symbols listed below are applicable, then check the versatility ratings for that symbol in the appropriate table.

IbU1 (Isla Bank undulating deep)

Versatility evaluation for soil IbU1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Risk of short-term waterlogging after heavy rain
Arable	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; risk of short-term waterlogging after heavy rain
Intensive pasture	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; risk of short-term waterlogging after heavy rain.
Forestry	High	No significant limitation

IbR1 (Isla Bank rolling deep)

Versatility evaluation for soil IbR1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Moderate	Rolling slopes; risk of short-term waterlogging after heavy rain
Arable	Limited	Rolling slopes
Intensive pasture	Moderate	Vulnerability to topsoil structural degradation by cultivation and compaction; risk of short-term waterlogging after heavy rain.
Forestry	High	No significant limitation

IbS1 (Isla Bank steep deep)

Versatility evaluation for soil IbS1		
Landuse	**Versatility rating**	**Main limitation**
Non-arable horticulture	Unsuitable	Steep slopes
Arable	Unsuitable	Steep slopes
Intensive pasture	Limited	Steep slopes
Forestry	Limited	Steep slopes

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging.
- Intensive stocking ,cultivation and heavy vehicular traffic should be minimised during these periods.

Soil profiles available for Isla Bank soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
IbU1	IT16	8	✓	✓	✓	✓
IbS1	EMT8	18	✓	✓	✓	✓
IbU1	CT20	6	✓	✓	✓	✓
IbS1	168/75/9	25	✓			

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